



Fourth GAIN World Conference

Paris, France
June 14-15, 2000

Analytical Methods and Tools

“Delta Air Lines Review of Spotfire Pro”

David Kocsis

***Supervisor, Flight Safety Assessment
Delta Air Lines***



Flight Safety at Delta

Mission Statement

Support the Delta commitment to safety as the first priority by assisting the operating departments to manage risk by identifying, evaluating, and resolving hazards, and by providing emergency and environmental management services.





Current Analysis Performed

- **Crew Operations Reports**
- **Trending - including BRIO tool**
- **FOQA Analysis (GRAF/PERMIT)**
- **Flight Visualization (Flight Viz)**
- **General report generation**



Delta's Interest in GAIN

- Improving the process for information sharing in the aviation safety community
- Improving current safety analyses by:
 - Considering new analytical tools and methods (such as Spotfire Pro)
 - Supporting the vision of our Flight Safety Office for developing and implementing an effective risk management program



Caveat

Delta participation with Working Group B helps illustrate the application of an analytical tool for possible use by a Flight Safety Office. Delta does not endorse individual analysis tools. We have had a brief demonstration of a data mining and visualization tool and limited experience with the tool. The following discussion provides Delta's first impressions of Spotfire Pro and are subject to change.





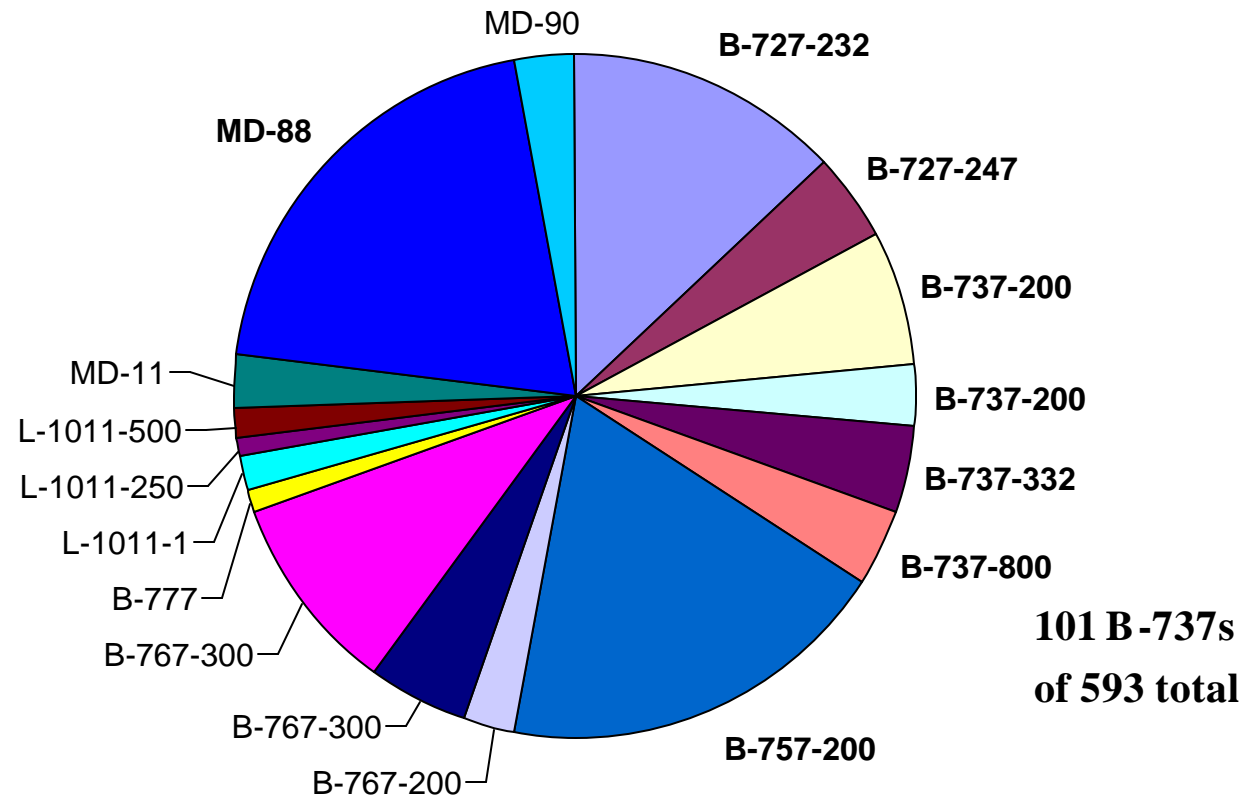
Spotfire Pro - Data Mining and Visualization Tool

- **Commercial-off-the-shelf product**
- **Desktop-software that enables users to interactively and quickly access, mine, visualize, and report on large volumes of complex, interdependent data**
- **Automatically generates intelligent visualizations and interactive queries**





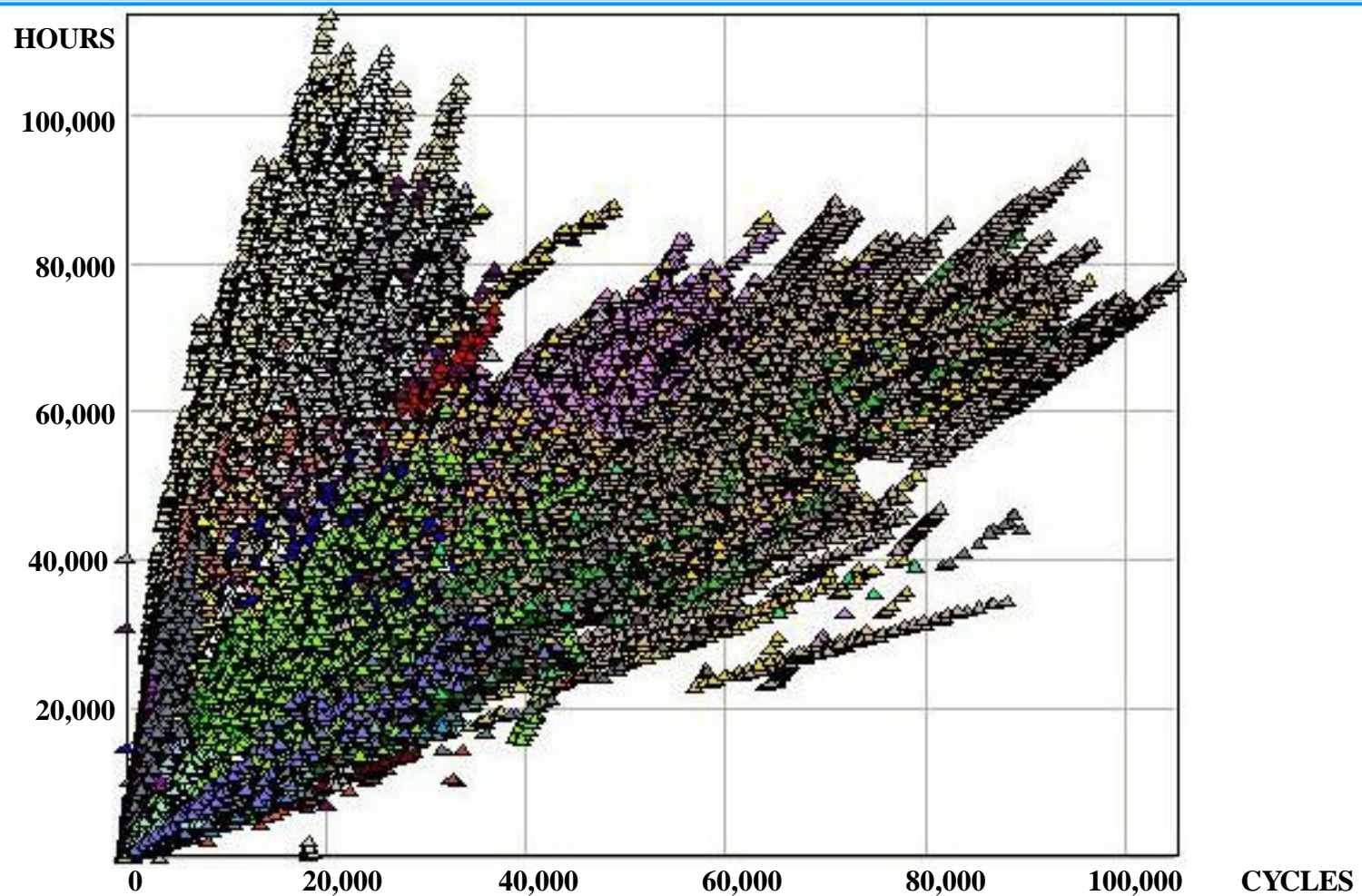
Equipment in Service





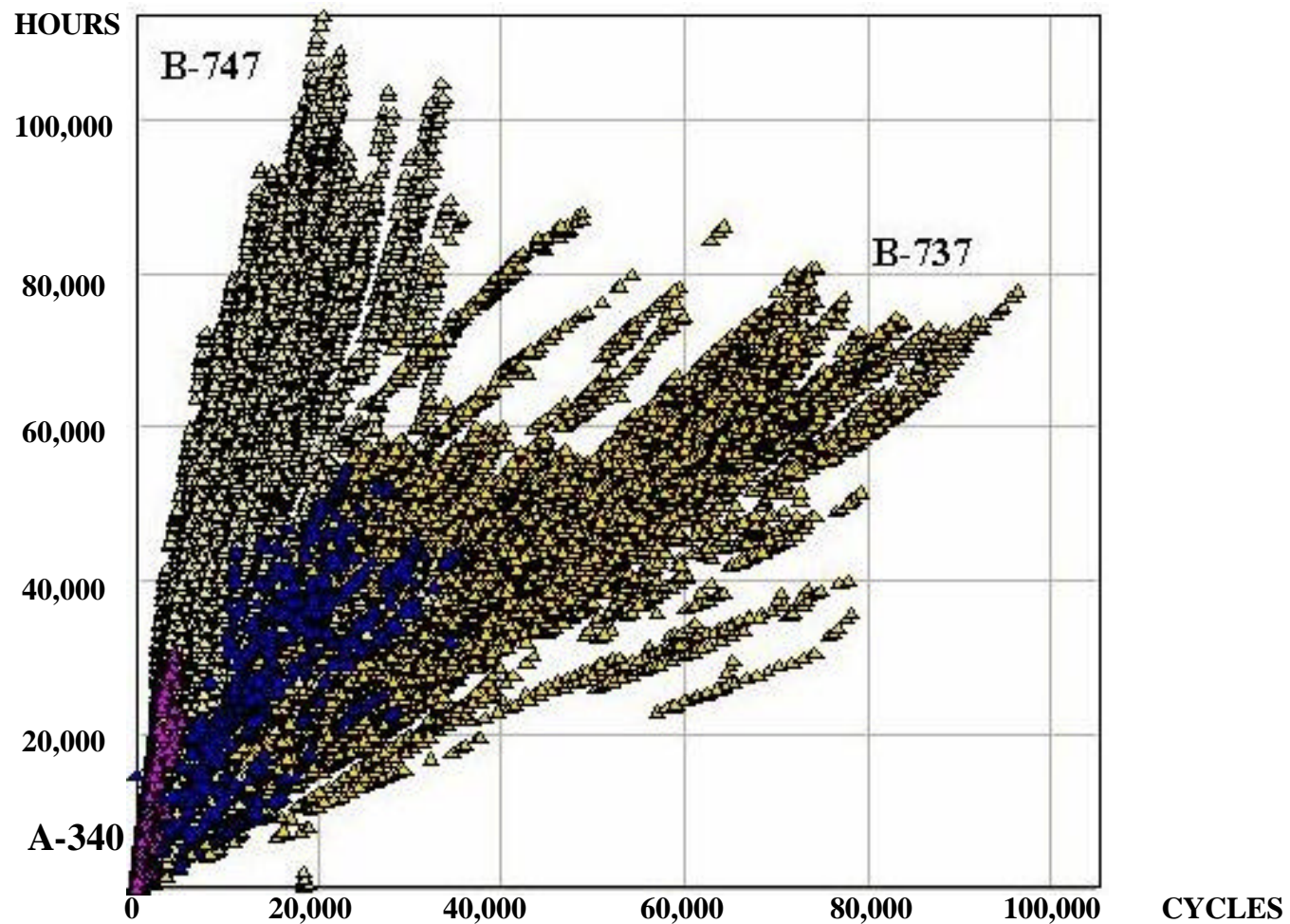
Spotfire Pro - Data Visualization

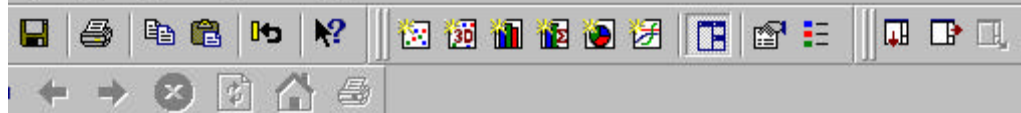
Scatter Plot: Aircraft Operations History



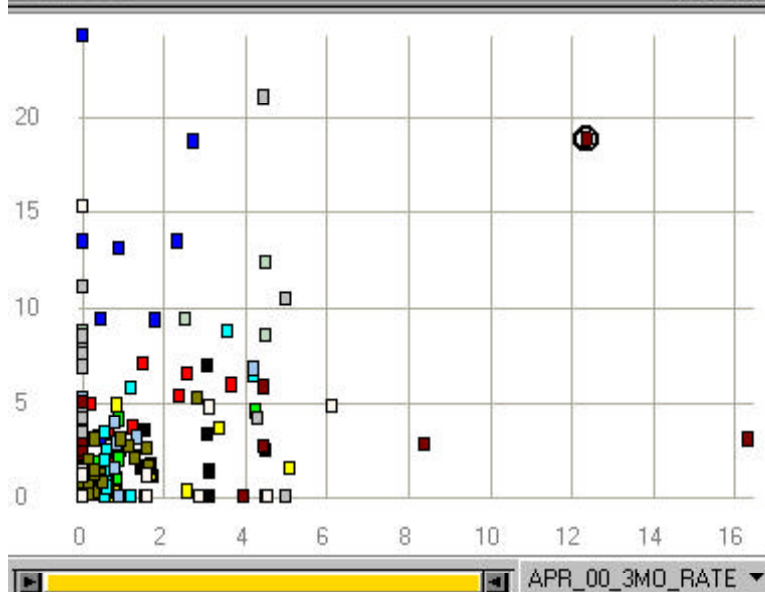


Spotfire Pro - Data Visualization Selected Aircraft Operations History

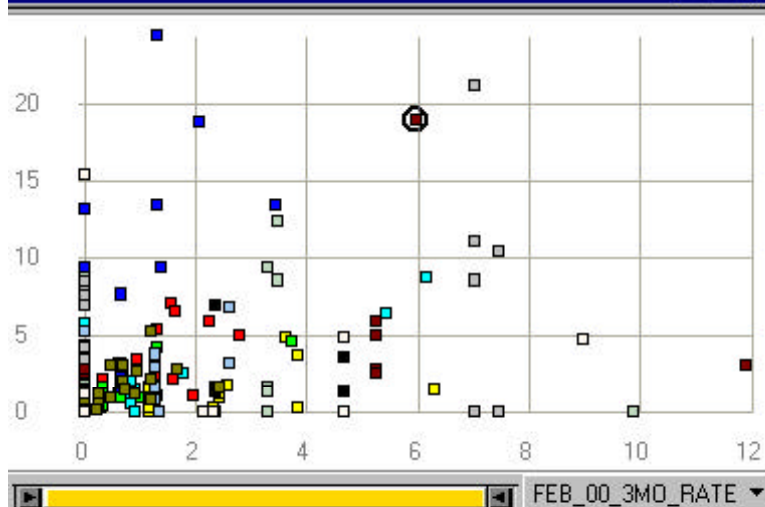




Scatter Plot

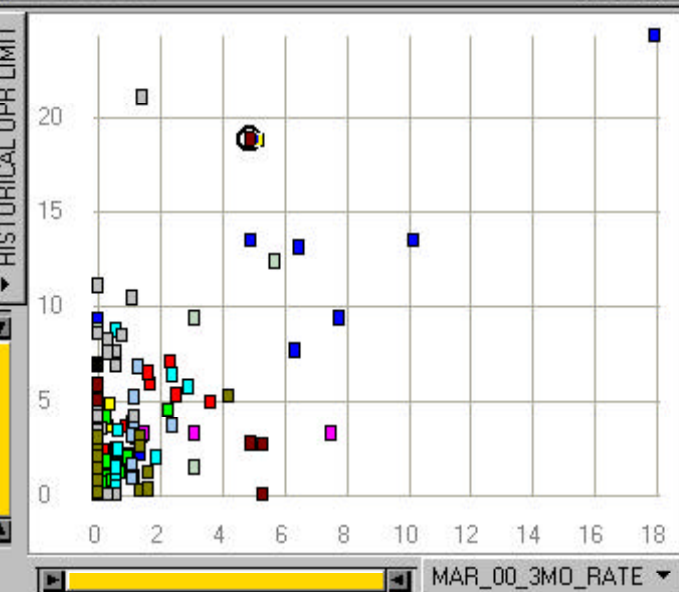


Scatter Plot

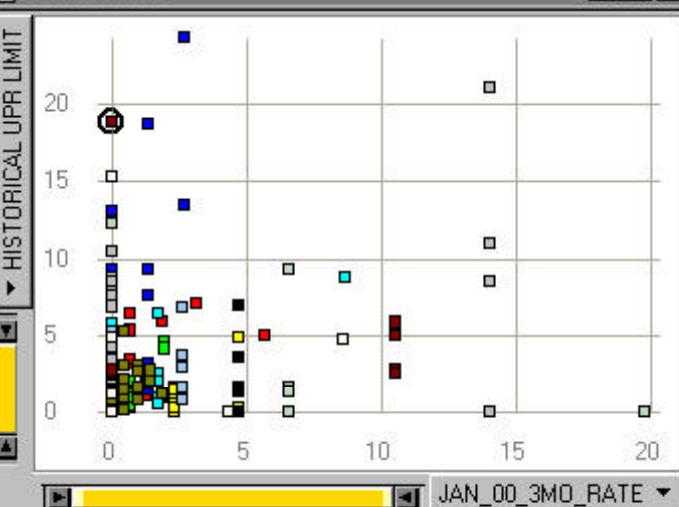


11:05

Scatter Plot



Scatter Plot



A/C TYPE

(All)

A/C SYSTEM

(All)

HISTORICAL RATE

0 7.45

HISTORICAL UPR LIMIT

0 24.36

JAN_00_3MO_RATE

0 19.79

Column	Value
A/C TYPE	L-15
A/C SYSTEM	LANDING G
HISTORICAL RATE	5.77
HISTORICAL UPR LIMIT	18.87
JAN_00_3MO_RATE	0
FEB_00_3MO_RATE	5.96
MAR_00_3MO_RATE	4.89
APR_00_3MO_RATE	12.37

299 out of 299 records visible (100.00 %), 0 marked



Operational Readiness Review Attributes

- **Usefulness**: “How helpful is tool to airline flight safety office? Is there a good match among:
 - Available input data
 - Capabilities/characteristics of tool
 - Airline’s higher-level information needs?”
- **Usability**: “How easy is tool to use in terms of set-up, applying input data, generating results, and disseminating results?”



Initial Impressions

“Usefulness”

- **Complexity of Analysis Process - Low**
 - Valuable tool, straightforward to use, minimal training required. Data manipulation from various sources.
- **Quality of Analysis Results - Excellent**
 - Repeatable and meaningful results generated. Rapid experimentation of different data mining and display ideas limited only by imagination and data source.
- **Application of Analyses results- Easy**
 - Graphical results easy to interpret. Need results that show a safety action or recommendation to prevent future events.



Initial Impressions

“Usability”

- **Tool Set-Up - Easy**
 - Additional plug-ins for special analysis functions are readily available from the web site.
- **Data Entry/Importation - Easy**
 - Data from various sources spreadsheets, relational databases, delimited text files. Can cut and paste data into Spotfire Pro - helpful and expedient.
- **Generation of Analysis Results - Easy**
 - Variety visual interactive representations. Data mining using color & interactive labeling. Query & text search. Rapid results sharing with ActiveX document server.



Closing Comments

- **We have an integrated approach to flight safety analysis.**
- **We support the analytical tools and methods initiatives of Working Group B.**
- **We look forward to continued partnering with Working Group B and encourage other airlines to considering partnering.**